PA: Community-based Stream Monitoring

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Alliance for Aquatic Resource Monitoring

Dickinson

ALLARM Background

Empower communities with scientific tools to monitor, protect, and restore PA streams.

Educate. Engage. Empower.

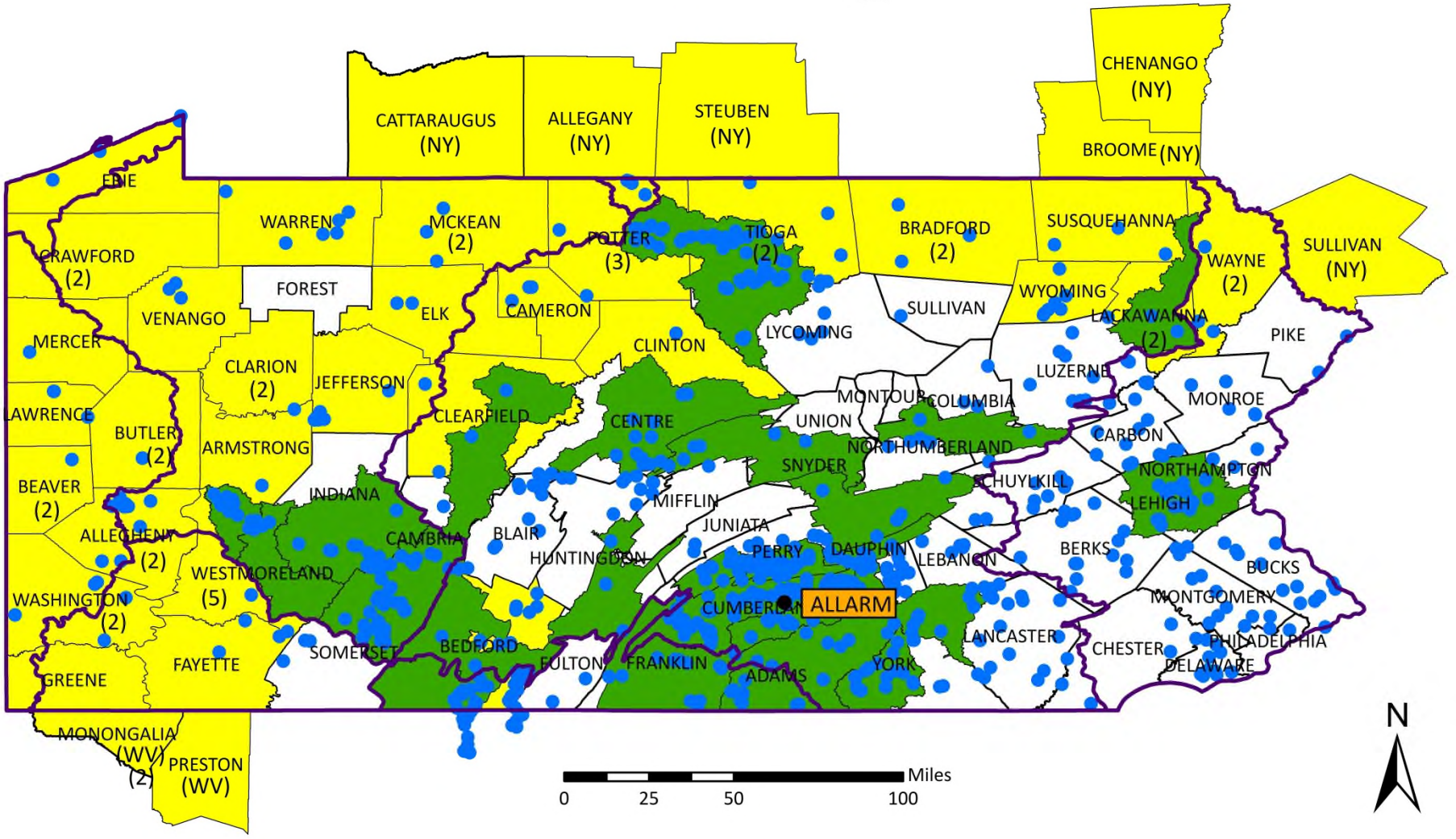
Who we are

Alliance for Aquatic Resource Monitoring
ALLARM
est. 1986

Educate. Engage. Empower.

Project of the Environmental Studies department (1986)
Director: Julie Vastine
Assistant Directors: Jinnie Monismith & Katie Tomsho
Science Advisor/Founder: Candie Wilderman
12-14 Dickinson College Students

ALLARM Monitoring Assistance



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- Acid Rain Sites
- Traditional Technical Assistance
- Shale Gas Workshops
- 6 Major PA Watersheds

Data Sources: ALLARM, NYS Office of Cyber Security, PA DOT, PSU, USGS, WVDEP

ALLARM Areas of Assistance

Technical

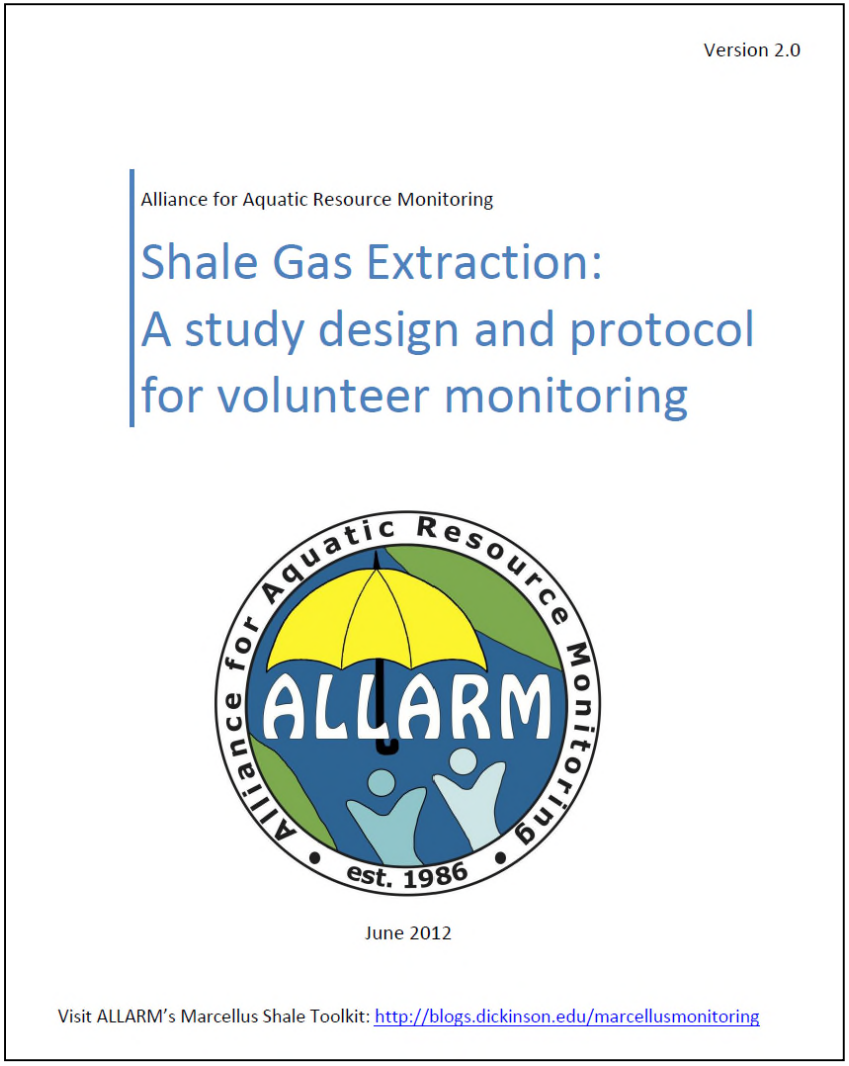
- Study design creation
- Chemical monitoring
- Macroinvertebrate monitoring
- Visual assessment
- Data interpretation and communication
- Shale-gas monitoring

Programmatic

- Strategic planning
- Volunteer recruitment and retention

What is a study design?

- A written document that describes the choices you make about monitoring
- Most important step of monitoring!



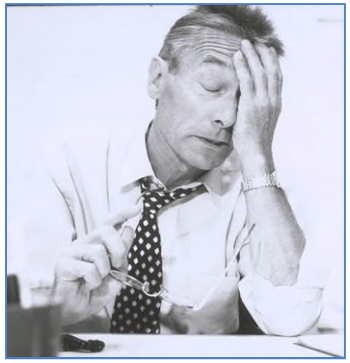
Why is a Study Design needed?

- Scientific process
- Focus
- Clearly articulated methods
- QA/QC
- Continuity

Lessons Learned in PA

- 1996 CVMP created
- 2000 Growing Greener
- 2001 Formation of C-SAW
- 2002 Standardized study design manual

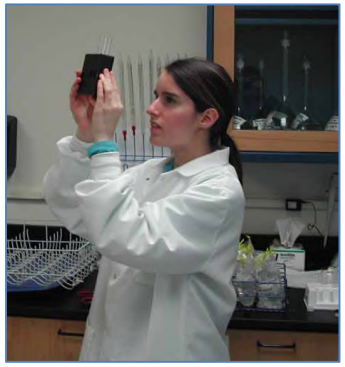
ALLARM Approach



Community Concern

Technical Assistance (ALLARM)

Monitoring trainings

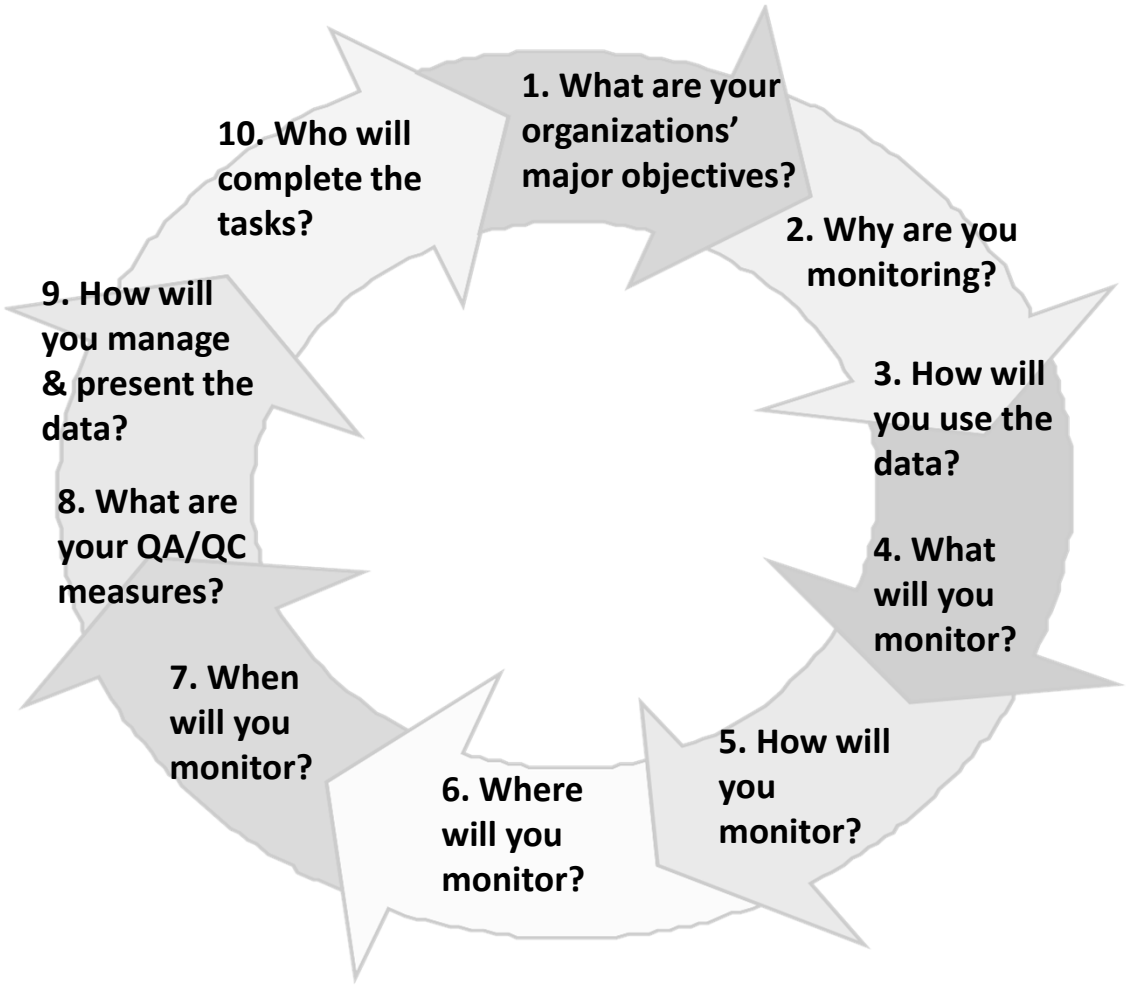


Data collection & quality verification

Data interpretation

Communities use data to protect and restore streams

Facilitating the study design process.



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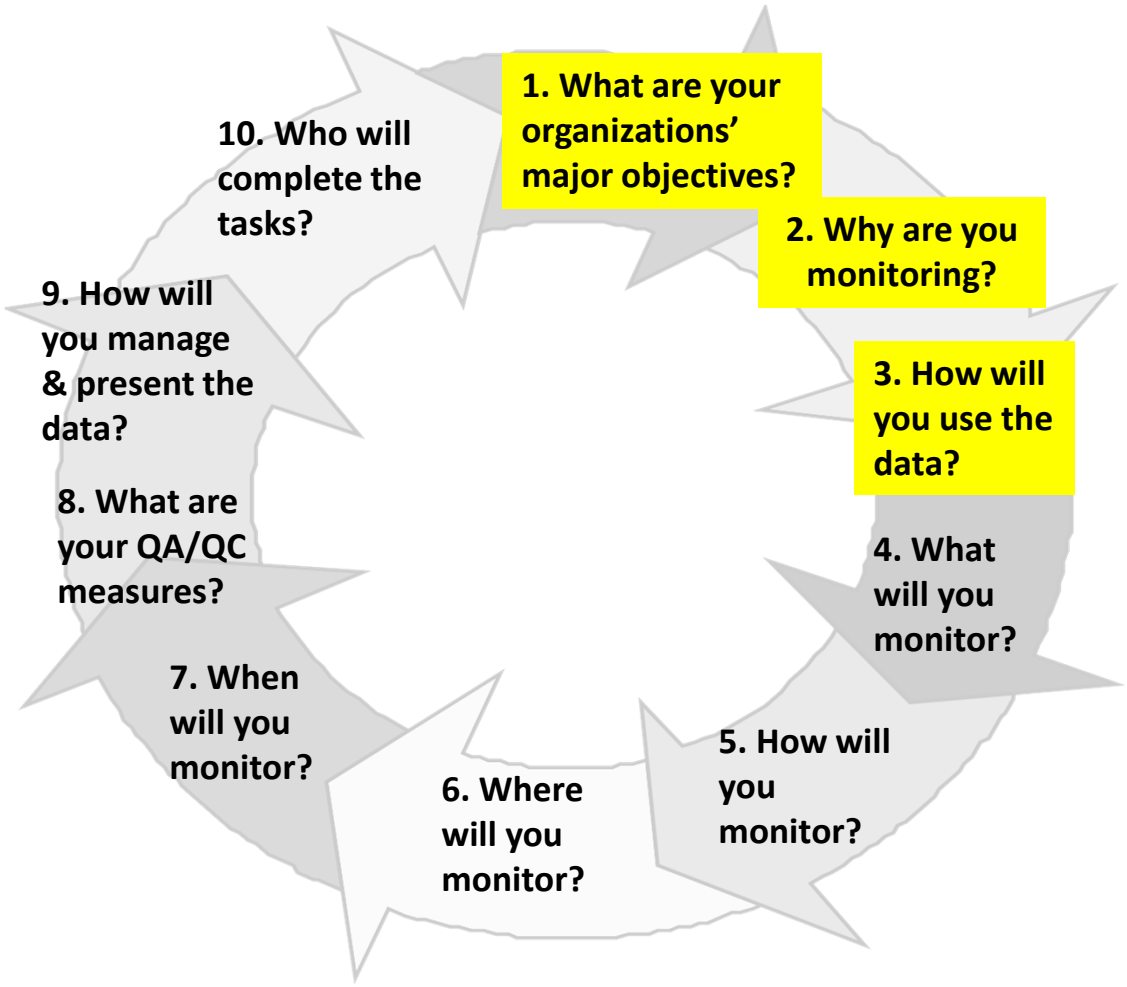

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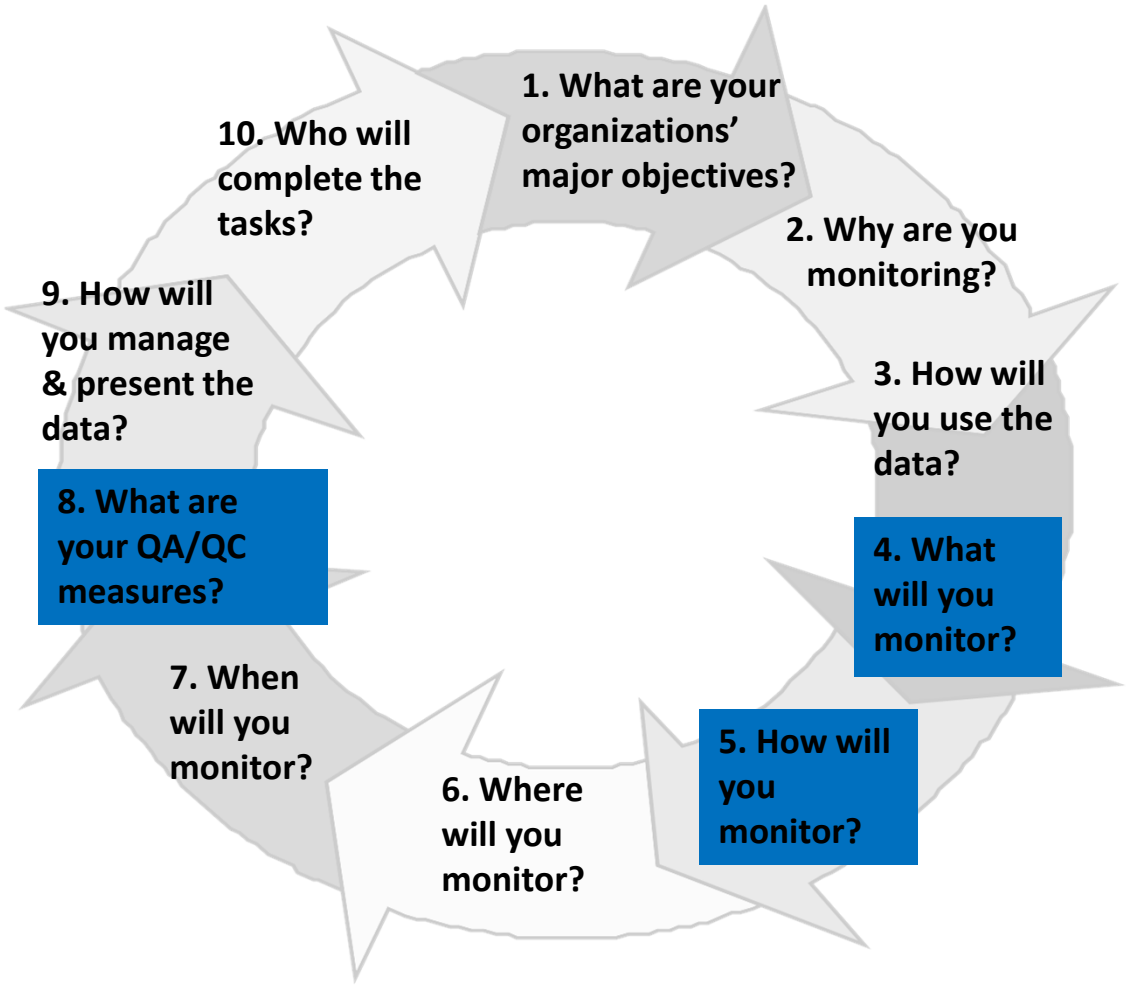

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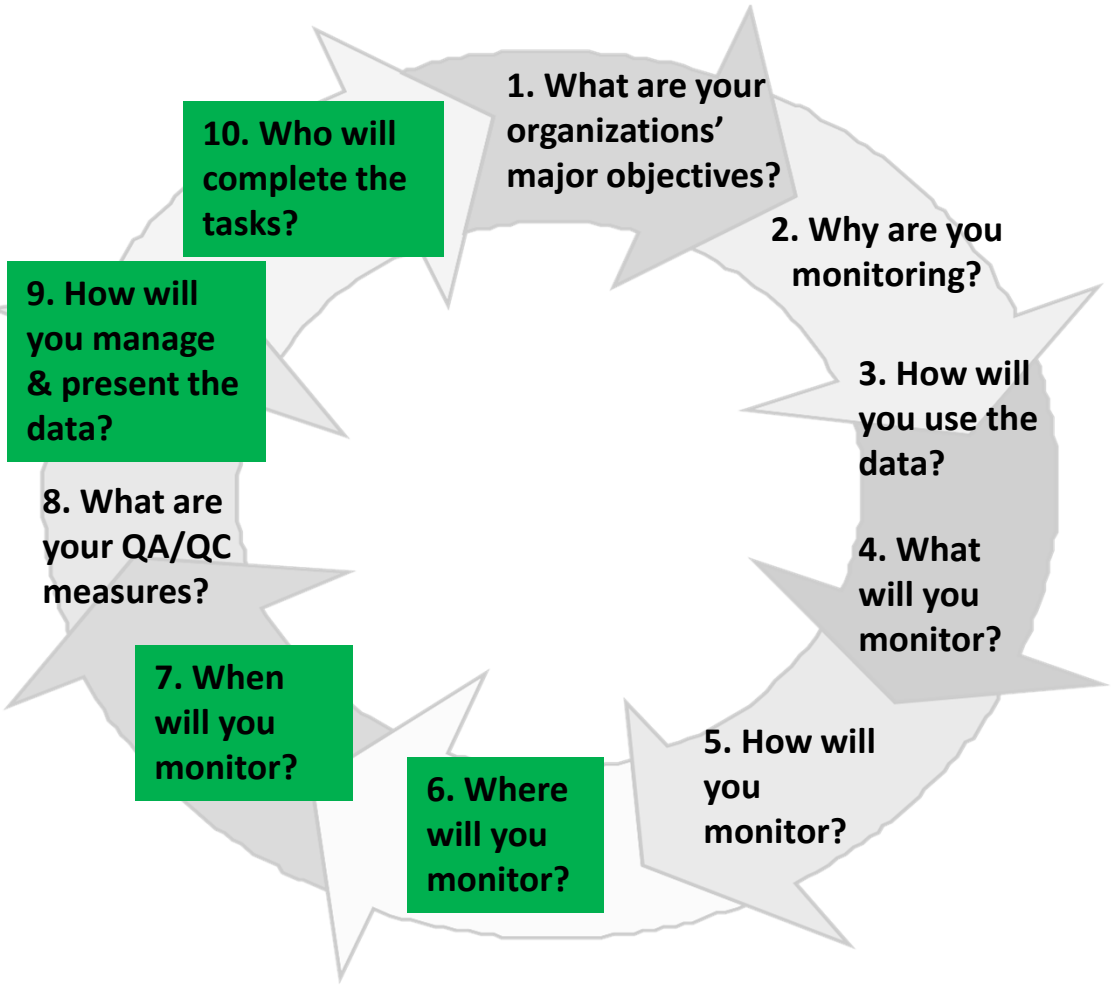
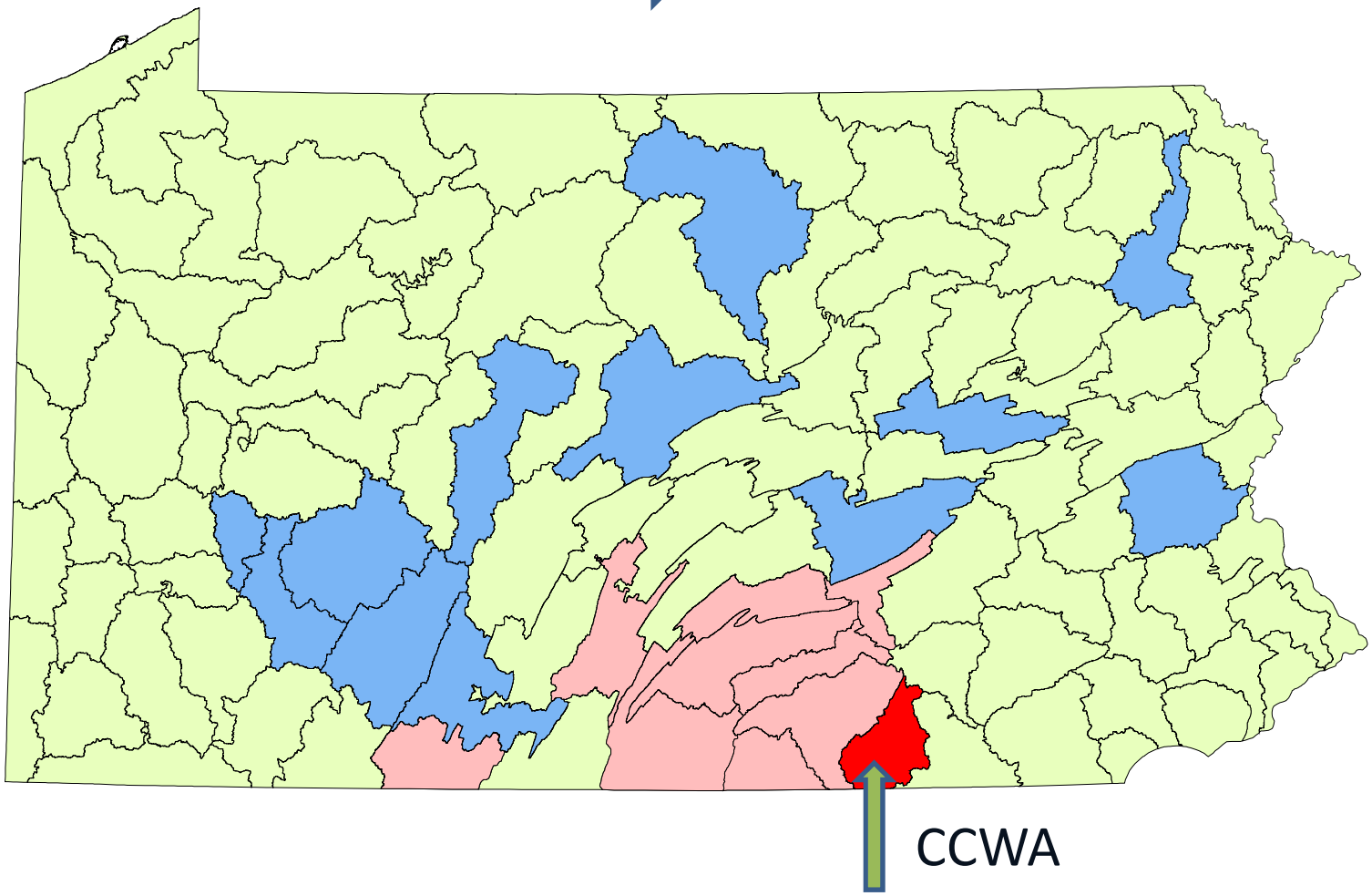


Facilitating the study design process.

Example: Codorus Creek Watershed Association

Watershed Issue → **Using Data in the Community**



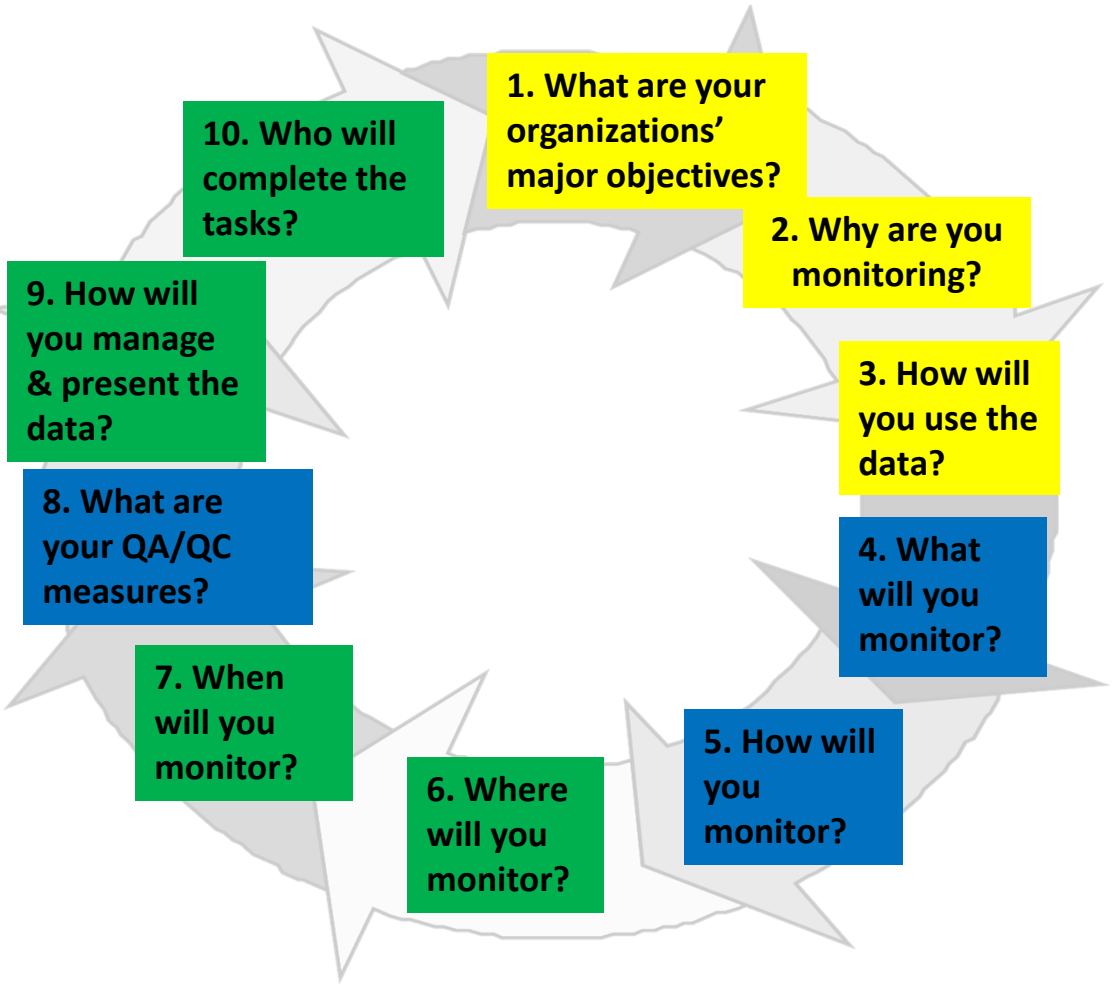
Codorus Creek Watershed Association

- Formed in 1998
- Glatfelter Paper Plant—discharges around 14 million gallons of wastewater daily into Codorous Creek
- “The Inky Stinky” (hydrogen sulfide & tannins)

Step 1: Study Design

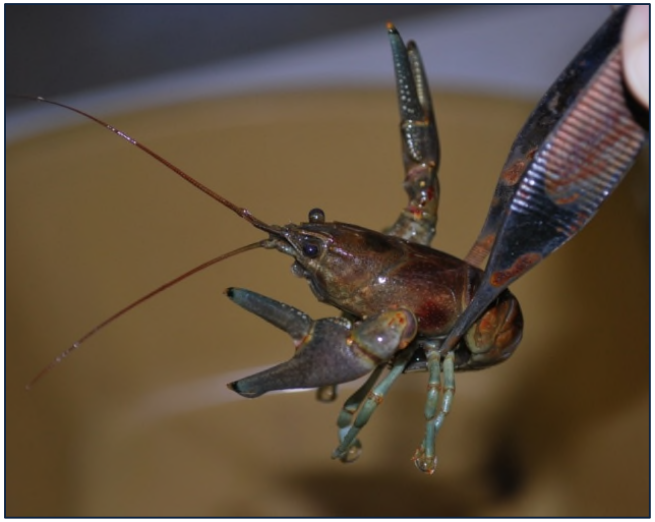
Issues:

- Glatfelter Paper Plant
- Agriculture



Step 2: Build Capacity

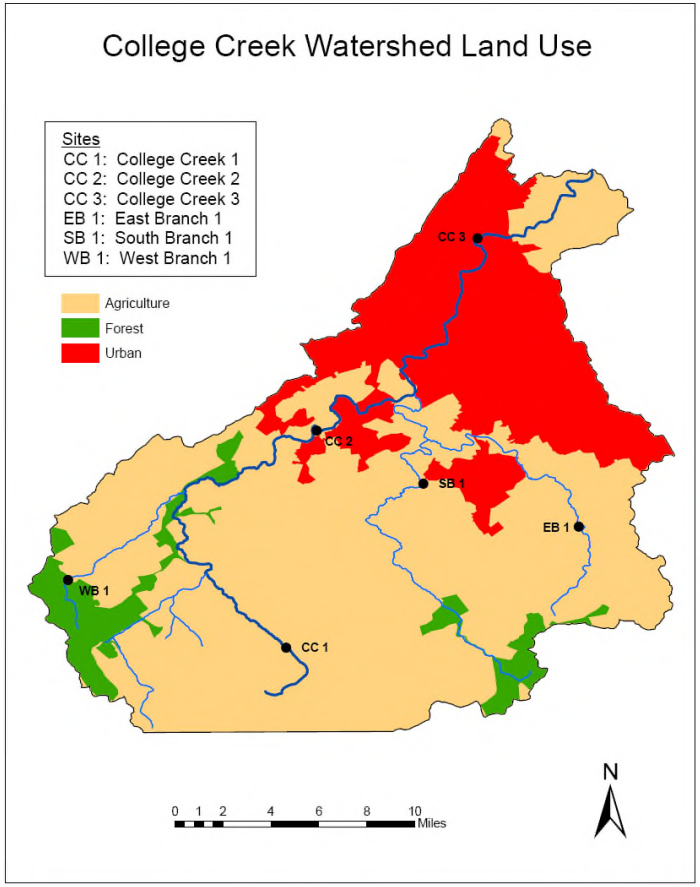
- Baseline Monitoring:
  - Chemical monitoring
  - Biological monitoring
  - Physical monitoring
- Paper Plant Monitoring
  - Water color
  - Temperature
  - pH



Step 3: Verify the quality of the data

- Split sample quality assurance process

Step 4: Interpret the data



Step 5: Use the data

- CCWA filed a lawsuit in 1999 against Glatfelter for violating CWA and their NPDES permit
- Settlement in 2001:
  - $2 million endowment fund for environmental improvement projects
  - $2.5 million in penalties
  - installed $32 million worth of new equipment to improve clarity of discharge
- Watershed report 2005
- Stream clean ups 2005-2013

PA Common Uses of Data

- Petitions to the state to upgrade stream designations;
- Impaired streams listing;
- MS4 collaborations;
- Collaborations with local governmental entities to incorporate stream protection into new development projects; and
- Increased stream health awareness in local communities.

Your role… service provider/state coordinator

- Determine your model, couple of options:
  - Standardized state program
  - State general guidelines, communities define program
  - Technical assistance to communities
  - Combination

Key Ingredients

- Develop comprehensive monitoring plan;
- Build groups' capacity to carry out water quality assessments;
- Verify the quality of data collected;
- Diminish the data road block; and
- Facilitate data use.

Anticipate major concerns/road blocks and have tools for communities to troubleshoot.

It’s okay to pause and regroup

- ALLARM Shale-gas monitoring
- Data wrangling issue 2011-2013
- Data analysis 2014
- Make it work!

ALLARM Contact Information

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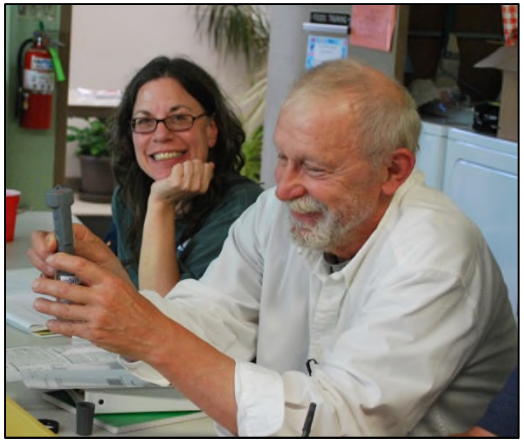
http://blogs.dickinson.edu/marcellusmonitoring/

1) What are is the organization's major objectives?

- Mission
- Major programs



- How does monitoring help the group achieve its organizational goals?

2) Why are you monitoring?

- Prioritize concerns
- What questions will monitoring help answer

http://news.bbc.co.uk/olmedia/1670000/images/_1672207_sewage2.jpg

3) How will you use the data collected?

- What action will you take with data – will inform quality needed
- Remember: how will data fit in with objectives

4) What will you monitor?

- Watershed indicators that will help answer your question (biological, chemical, physical characteristics)

- Practical considerations:
  - Do you have the human & financial resources to measure it?
  - How difficult is it to monitor?
  - Does it help you understand a major component of the ecosystem?
  - Is it understandable and explainable to the target audience?

5) How will you monitor?

- Determining appropriate analytical methods that meet your data objectives.

- Examples:
  - Accuracy & Precision – LaMotte/HACH kits vs. lab analysis
  - Grab samples, integrated samples, direct measurement samples
  - Qualitative net collection or semi-quantitative net collection
  - Maximum holding times, reporting units, transport to lab

6) Where will you monitor?

Consider safety & accessibility, potential water quality impacts, reference locations, stream designated uses.

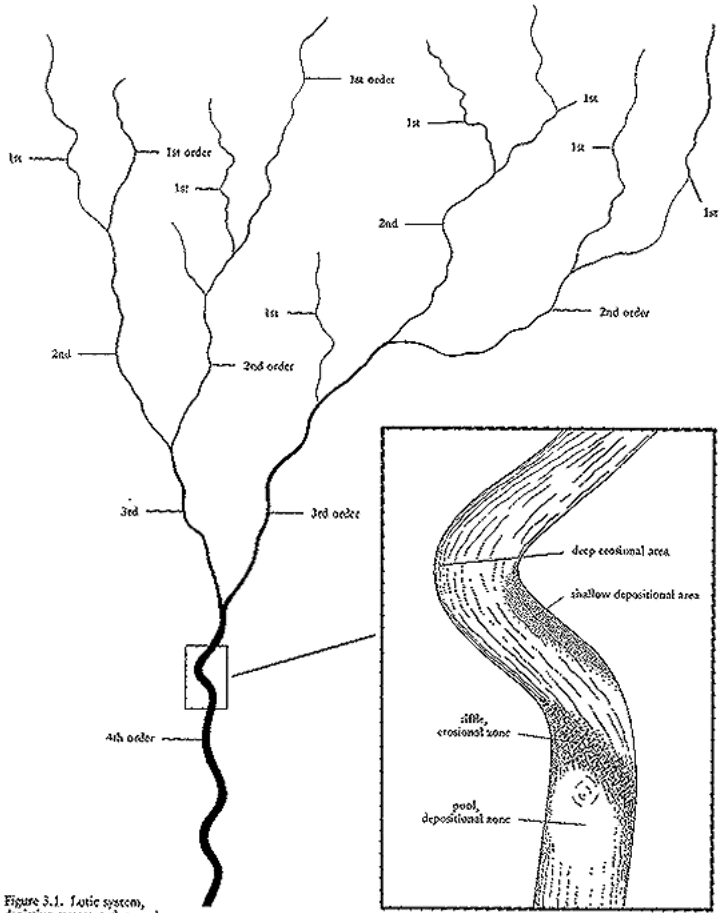


Figure 3.1. Lotic system, depicting stream orders and lotic zonation.

7) When will you monitor?

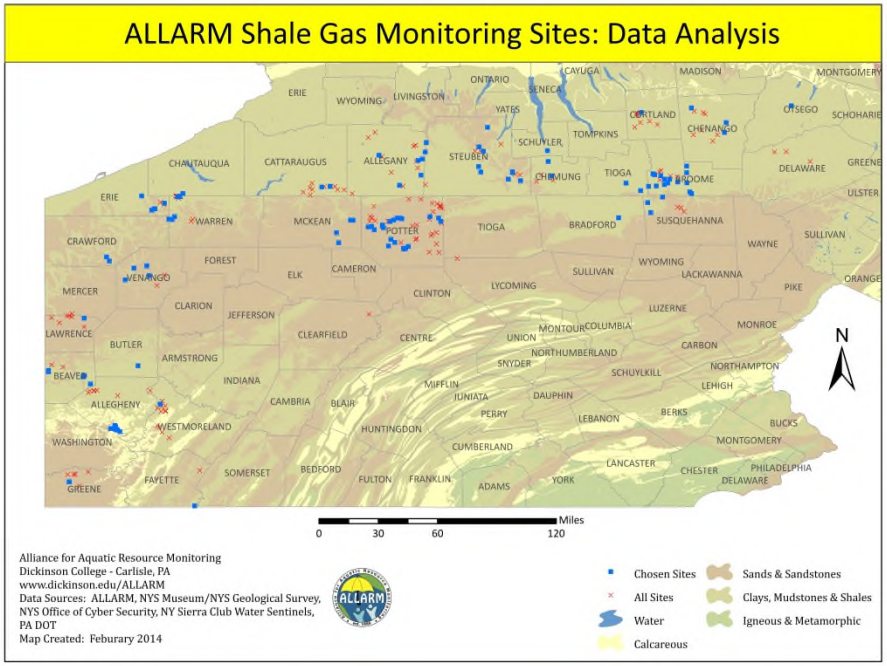
- What time of year?
- What time of day?
- Special weather conditions – storm events, drought, etc.?
- Frequency of sampling? Consider resources and data requirements.

8) What are your Quality Assurance measures?

- Crucial piece!
- Training
- Equipment care and calibration
- How do you ensure the data are credible.
- Documentation, documentation, documentation – Study Design to data sheets.

9) How will you manage and present the data?

- Management
- Interpretation
- Communication



10) What are the tasks and who will do them?

Develop job description for volunteer positions.

- Program Coordinator
- Quality assurance
- Purchase equipment
- Analyze data
- Recruit and organize volunteers
- Report findings
- Train field and lab volunteers
- Monitoring
- Evaluate your study design

Communication Plan

- What is the story in your data?
- What do you want to communicate to your data users (identified in step 3)?
- Other audiences to consider?
- Identify communication outlets, appropriate for your audience (reports, newspaper articles, town meetings).
- Evaluate response to data story and outcomes – how are the data used?

Volunteer Monitoring: Cost Effective – Not Cost Free

- Staff (incredibly hard-working, usually underpaid)
- Field and lab equipment and supplies
- Laboratory space or analytical services
- Office supplies
- Communication and mailing
- Publications
- Conferences / workshops
- Transportation (personnel or samples)
- Insurance
- Special events / volunteer recognition

Applying knowledge to improve water quality
Volunteer Water Quality Monitoring
National Facilitation Project
A Partnership of USDA CSREES & Land Grant Colleges and Universities

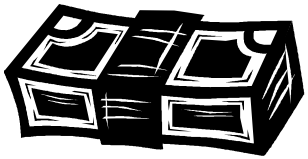
Volunteer $$$ As Match for a Grant

- Volunteer time can often be used as match
- Document effort
  - Start/end time on data sheets
  - Survey average time per sampling event
- Identify acceptable 'hourly rate' equivalent
  - 2011 is $21.79 per hour
- Independent Sector
  www.independentsector.org/volunteer_time

Corporation for National & Community Service

62.7 million Americans, or 26.5 percent of the adult population, gave 8.1 billion hours of volunteer service worth $173 billion in 2010

For the latest information, please see www.volunteeringinamerica.gov



Dollar Value of a Volunteer Hour, by State: 2010

Alabama: $18.06	Indiana: $18.04	Nebraska: $16.86	South Carolina: $16.91
Alaska: $21.69	Iowa: $17.22	Nevada: $18.82	South Dakota: $15.60
Arizona: $19.71	Kansas: $18.13	New Hampshire: $21.29	Tennessee: $19.21
Arkansas: $16.48	Kentucky: $17.65	New Jersey: $25.64	Texas: $21.91
California: $24.18	Louisiana: $19.06	New Mexico: $17.44	Utah: $17.92
Colorado: $22.03	Maine: $16.84	New York: $27.32	Vermont: $17.77
Connecticut: $27.77	Maryland: $22.77	North Carolina: $18.80	Virginia: $22.60
Delaware: $22.34	Massachusetts: $26.84	North Dakota: $17.49	Washington: $21.01
Dist. of Columbia: $33.61	Michigan: $20.07	Ohio: $18.87	West Virginia: $17.01
Florida: $18.66	Minnesota: $21.62	Oklahoma: $17.49	Wisconsin: $18.20
Georgia: $20.38	Mississippi: $15.43	Oregon: $18.85	Wyoming: $18.97
Hawaii: $18.08	Missouri: $18.80	Pennsylvania: $20.86	Puerto Rico: $11.41
Idaho: $15.93	Montana: $15.28	Rhode Island: $19.57	Virgin Islands: $16.29
Illinois: $22.77			

Wrapping up…

Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."--
Margaret Mead